

Scientific Inquiry

3-1 The student will demonstrate an understanding of scientific inquiry, including the processes, skills, and mathematical thinking necessary to conduct a simple scientific investigation.

3-1.7 Explain why similar investigations might produce different results.

Taxonomy Level: 2.7-B Understand Conceptual Knowledge

Previous/Future knowledge: In 1st grade (1-1.3), students carried out simple scientific investigations when given clear directions. In 7th grade (7-1.4), students will explain the importance that repeated trials and a well-chosen sample size have with regard to the validity of a controlled scientific investigation. In 8th grade, students will recognize the importance of a systematic process for safely and accurately conducting investigations (8-1.2) and explain the importance of and requirements for replication of scientific investigations (8-1.5).

It is essential for students to explain why results might be different even though the same investigation testing the same factors was being done by several groups. Reasons why an investigation could produce different results may be:

- The setup of the materials was not followed properly or in the exact same way.
- Similar procedures were not followed in the exact same way.
- Appropriate tools were not chosen to complete the experiment.
- Tools were not used properly.
- Measurements were not taken accurately.
- Different observations were collected.
- Mistakes were made when recording data, such as numbers written incorrectly.

Assessment Guidelines:

The objective of this indicator is to *explain* why similar investigations might produce different results; therefore, the primary focus of assessment should be to construct a cause-and-effect model of the various ways that results are affected by different situations. However, appropriate assessments should also require students to *recall* how to carry out a scientific investigation; *infer* reasons why investigations may have different results; *compare* two or more investigations to observe how they differ; or *exemplify* ways the results of a scientific investigation can be affected.